

# ELECTRIC IMPACT TOOL

SIZE 4U

FOR USE WITH

110 VOLT DIRECT OR ALTERNATING CURRENT

## Instructions and Part List

*Remove Hammer Case and Grease Impact Unit.  
After Each 20 Hours of Operation.  
Use I-R Impact Wrench Grease No. 100.  
See Lubrication Instructions On Page 3.*



This booklet has been carefully prepared to enable you to obtain the utmost service and value from the Size 4U Impact Tool. After thoroughly reading it, preserve it for future reference and to facilitate the ordering of repair parts.

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# Ingersoll-Rand



# INDEX

Subject	Page and Paragraph
<b>Accessories</b> .....	9, 10, 11, 12, 16, 17, 18, 19
Adapter, Screw Driver.....	11, 19
Bits, Screw Driver.....	11, 12, 18, 19
Brush, Carbon Removing.....	10
Chuck, Collet Type.....	9, 17
Quick Change.....	11, 18
Drill, Masonry.....	9
Twist.....	9
Drift, Morse Taper.....	12
Extractor, Screw.....	9
Joint, Universal.....	12
Reamer.....	10
Remover, Stud.....	10
Saw, Hole.....	10
Sleeve, Morse Taper.....	10
Sockets, Hex and Square.....	16
Morse Taper.....	10
Taps.....	10
<b>Application</b> .....	8
<b>Assembly of Tool</b> .....	6
<b>Bearings, Armature</b> .....	4, 6, 8 par. 6
<b>Brushes, Care of</b> .....	5
Assembly.....	5, 8 par. 10
<b>Bushings Replacement</b> .....	6
<b>Commutator, Care</b> .....	5

Subject	Page and Paragraph
<b>Cable, Description and Care</b> .....	3
Assembly.....	8 par. 12
Grounding.....	4
<b>Cap, Reverse</b> .....	
Disassembly.....	5 par. 1
Assembly.....	8 par. 11
<b>Disassembly of Tool</b> .....	5
<b>Fan, Care of</b> .....	6
<b>Gears, Planet, Assembly</b> .....	6 par. 1
Disassembly.....	6 par. 12
<b>Grounding Tool</b> .....	4
<b>Lubrication</b> .....	3, 8 par. 9
<b>Motor, Description</b> .....	3
Loss of Power.....	4
<b>Operation of Tool</b> .....	4
<b>Part List</b> .....	15
<b>Reverse Cap, Disassembly</b> .....	5 par. 1
Assembly.....	8 par. 11
<b>Reversing Tool</b> .....	4
<b>Screw Driving Equipment</b> .....	18, 19
<b>Sectional View with Parts Numbers</b> .....	14
<b>Socket Retainer, Replacement</b> .....	6
<b>Trigger, Description</b> .....	4
Disassembly.....	6 par. 6
<b>Wood Auger</b> .....	11



# INSTRUCTIONS

The Ingersoll-Rand Size 4U Impact Tool is designed and constructed to save time and labor in manufacturing and maintenance operations, and to make easy many tasks now considered arduous and difficult about garages, service stations, machine shops, etc. Because of its versatility its uses are practically unlimited.

The Size 4U Impact Tool as a whole is new, but it actually is a combination of two proven units. The ball and cam impact unit has been successfully incorporated in both air-driven and high-cycle electric I.R. Impact Wrenches for several years and has been well received by industries. In producing the Size 4U, Ingersoll-Rand has applied to this proven impact unit a special universal electric motor, built by one of the oldest and most reputable motor manufacturers in the country.

## MOTOR

The Size 4U Impact Tool is driven by a "universal" type motor. It will operate on either Direct Current or Alternating Current of 25, 40, 50 or 60 cycles of 110 volts. Use on lower voltage will reduce motor speed and power and cause overheating. If used on higher voltage, the speed will be abnormally high, the motor will overheat and serious damage will probably result.

The motor is air cooled. A Fan located on the front of the Armature is designed to draw an ample supply of cool air into the Housing and keep the motor at a cool, efficient operating temperature provided the ventilating ducts are not restricted or covered.

## CABLE AND SWITCH

A good quality, three conductor Cable is supplied with the 4U Impact Tool. It should be regarded as an important part of the tool and treated with consideration. When not in use it should be loosely coiled and hung on a wooden peg beneath the tool (Fig. 1). Avoid kinking and rough handling such as dragging across sharp or rough surfaces. Do not drag or lift tool by Cable (Fig. 2) as this not only is a strain on the Cable but upon the connections as well. Avoid leaving Cable where it is apt to be run over or struck and cut by falling objects. Although the Cable is of the oil resisting type, wipe it off occasionally to free it of oil and grease.

The Switch is located within the grip section of the Housing. Access to it is gained by unscrewing the Handle Plate Screws (parts 226 and 229) and removing the Handle Plate (part 224). (See page 14 for illustration with part numbers). A Switch Screw (part 262) and Switch Pivot Screw (part 359) retain

the Switch within the grip section. Two leads of the Cable and two field leads are connected to the Switch. When replacing either a Switch or Cable be sure leads are securely fastened and that the green wire of the Cable is connected to the Housing. This is the ground conductor, provided to protect the operator from shock should the motor become short-circuited to the Housing.

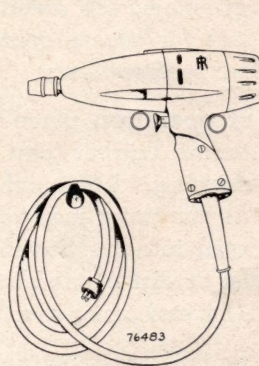


Fig. 1 Hang tool and cable on wooden pegs when not in use.



Fig. 2 Do not lift tool by cable.

## LUBRICATION

Use Ingersoll-Rand Impact Wrench Grease No. 100 for lubricating the Size 4U Impact Tool. This grease is specially compounded and prepared for Impact Wrench service. There is no suitable commercial substitute grease now on the market with the characteristics necessary to properly lubricate the impact unit. Only as an emergency measure should any other grease be used. For this we recommend a good, sticky, semi-fluid gear grease.

Before putting the Tool in service, hold it with the square driver upward and put a few drops of machine oil around the shank of the Anvil (part 726P) where it emerges from the bronze Bushing in the front of the Hammer Case. This procedure should be repeated at intervals when the Tool is being used to a great extent on direct drive applications such as drilling or wire brushing where the impact unit does not function.

After each ten hours of operation or as experience dictates insert a small amount (3 or 4 strokes of Grease Gun) of the above grease into the Grease Fitting (part 188). Grease inserted through this Fitting lubricates both the gearing and impact unit.

After each twenty hours of operation, remove the Hammer Case (part 727P) and check the lubrication of the impact unit. If necessary, coat with No. 100 Impact Wrench Grease, the jaws of the Anvil



(part 726P) and Hammer (part 724P), the pilot of the Planet Gear Frame (part 8P) that enters the Anvil and the bearing surfaces of the Anvil. Push a small amount of No. 100 Grease into the cam grooves in the front of the Hammer to furnish lubrication for the Cam Balls. Do not apply grease to the outside diameter of the Hammer (part 724P) as this is not a bearing surface.

**Caution:**—The use of too much grease will cause the Wrench to operate in a sluggish manner with subsequent loss of power or may cause excessive heating of the impact unit. If these symptoms are noted remove Hammer Case and check for grease content, removing excess grease before reassembling.

**After each forty hours of operation** place one or two drops of machine oil on the Trigger (part 93) where it emerges from the Housing. Too much oil or too frequent lubrication at this point may result in the excess oil working down into the Switch or onto the terminals where dust or dirt carried in by the Fan may adhere to the oil film and cause shorting.

The Armature Bearings ( parts 22 and 24) are of the grease-sealed type having a plate on one side and a felt seal on the other. These are permanently lubricated, having had a sufficient amount of lubricant packed in them at the factory to last the life of the Bearings. **Always wipe** these Bearings clean; **never immerse** in solvent as this will dilute the lubricant.

## GROUNDING

For the operator's protection any electric tool should be grounded while in use. This precaution will protect the operator from shocks should a short circuit occur, and is of special importance when moisture or dampness is present.

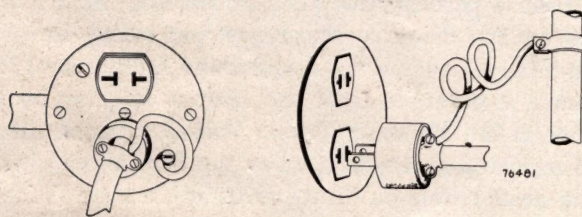


Fig. 3 Tool should be grounded.

The Size 4U is equipped with a three conductor Cable. The short piece of green conductor protruding from the Cable near the Plug is for grounding the tool, the opposite end being securely attached to the Housing (part 40) within the grip section. To ground the tool this green wire must be connected to either a natural ground such as a waterpipe, conduit or metal framework of a building, or to an artificial ground such as a driven rod, buried plate, or other special grounding device. The simplest

method of grounding is to fasten the end of the green wire securely to the outlet cover with the cover screw. **However, this is effective only if rigid or flexible grounded conduit or an electrical ground is used. The ground conductor is provided for the operator's protection, but is only effective when connected.**

**Note:**—Some wiring systems are permanently grounded by using three-wire receptacles. On such installations a three pole plug must be substituted for the one furnished with the tool after which the tool is automatically grounded whenever the Plug is inserted into the outlet.

## OPERATION

After grounding the tool, as previously described, and inserting the Cable Plug in the outlet, the Size 4U is ready for use. Depressing the Trigger starts the motor, causing the square driver to rotate. Direction of rotation is determined by the position of the Reverse Cap (part 666). Rotating the Cap sixty degrees reverses the direction. When changing the direction of rotation, make sure that Cap is rotated as far as the Reverse Stop (part 665) will permit. The Cap is retained in either extreme position by two Reverse Lock Balls (part 663) being forced into indentures in the Cap by the Reverse Lock Springs (part 664). It will be noted that the fin at the top of the tool continues from the Housing back into the Cap so that it serves as an indicator. When the fin on the Cap aligns with that on the Housing, the square driver will rotate in the forward direction (i.e., the direction for tightening nuts or cap screws with right-hand threads).

For all ordinary operations the tool is turned off and on frequently with the result that the motor temperature remains normal. Continuous operation will cause the motor to heat. When using this tool under severe operating conditions and excessive heating is noted, shut the motor off and allow it to cool.

## MAINTENANCE INSTRUCTIONS

Loss of power and erratic impact action can usually be attributed to the following causes and can be corrected as noted.

1. The most common cause of power loss is an excessive amount of grease in the Hammer Case (See Lubrication Section). To correct, unscrew the three Hammer Case Cap Screws (part 638) and remove the Hammer Case (part 727P). Remove excess grease but make sure that jaws and bearing surfaces of unit are amply coated with the recommended lubricant before reassembly.
2. After long service the Hammer Spring (part 728P) may take a permanent set. This condition impairs the efficiency of the Wrench because the



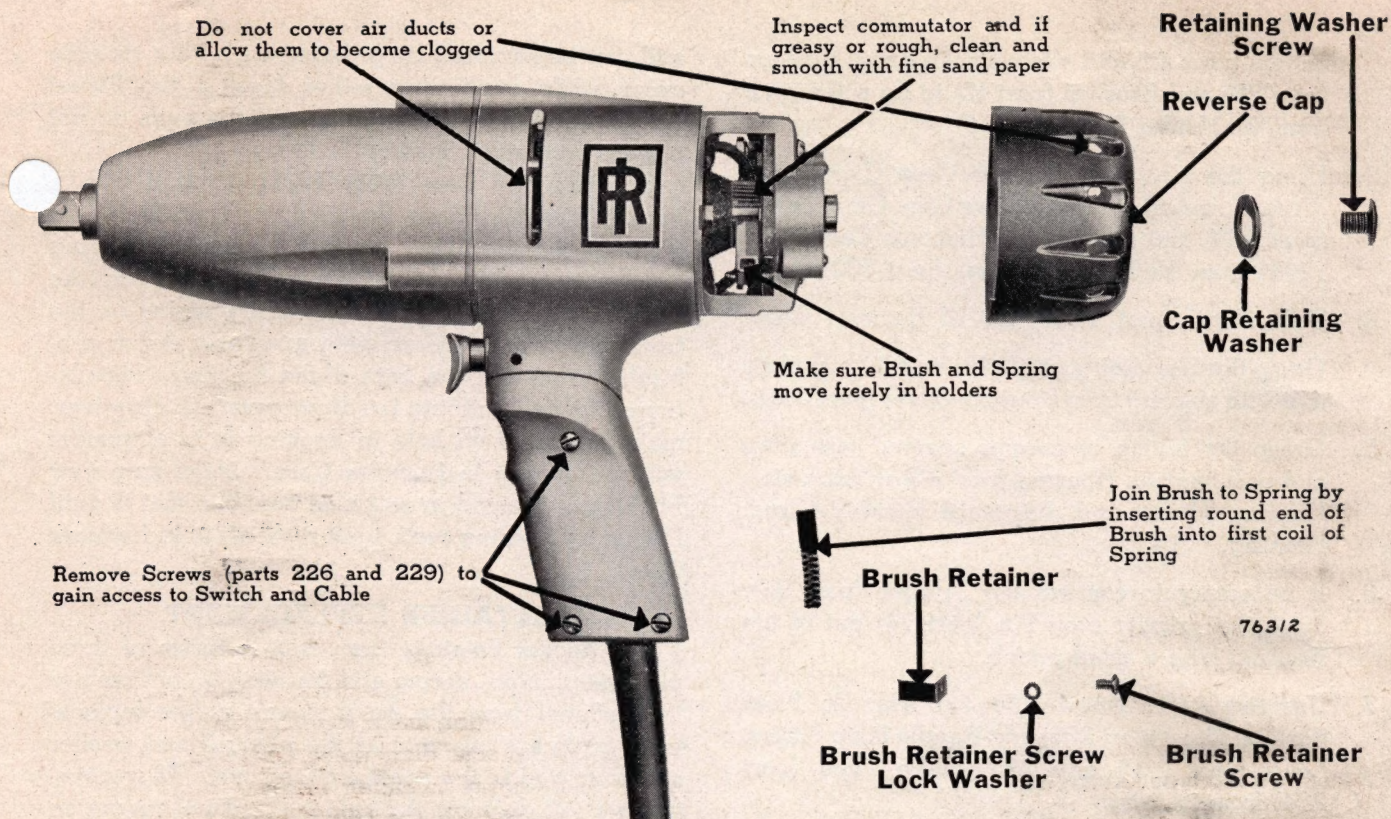


Fig. 4.—Care of Commutator and Brushes.

Hammer jaws are striking the Anvil jaws at less than full depth. Continued operation with a weak Hammer Spring may result in breakage of the jaw corners due to decreased striking area. To check Spring, place the Hammer unit in an arbor press with the gear end up and the front faces of the Hammer jaws supported. Press on the gear end of the Planet Gear Frame (part 8P) until the two Cam Balls (part 722P) drop out. Release unit from press and withdraw Gear Frame from Hammer (part 724P). Measure the free length of the Spring and if less than  $1\frac{1}{4}$ " it should be replaced.

3. If the jaws of either the Hammer or Anvil (part 726P) become worn or upset, loss of power will be noted. In such cases the worn parts must be replaced. When replacing either the Hammer or Anvil, note the condition of the jaws of the matching part and if badly worn or upset, replace this part also. The use of a new Anvil with a worn Hammer or vice versa is false economy as the wear on the new part will be rapid.

### BRUSHES AND COMMUTATOR

Frequent inspection of the Brushes (part 12) and Commutator is recommended. Badly worn Brushes should be replaced at once as they can cause serious damage if neglected. Access to these parts is gained by unscrewing the Retaining Washer Screw (part 667) with the No. 562 Wrench furnished with the tool and removing the Cap Retaining Washer (part 675) and Reverse Cap (part 666). Brushes should be

kept free of dust and dirt; must slide freely in the holders, and must be maintained in firm contact with the commutator by the Brush Springs (part 28). Check Brush Spring in holder to insure free movement.

The commutator, if found to be greasy or rough can be cleaned and smoothed with very fine sand paper (never use emery cloth). If grooved by the Brushes it should be removed and turned down until a smooth surface is again obtained. As this is a vital part of the motor only a skilled mechanic should attempt to perform the above operation.

Failure of the motor to start or to operate efficiently can usually be attributed to worn or damaged Brushes, Brushes sticking in the holders and failing to make proper contact with the commutator, or to the commutator becoming dirty or rough.

### DISASSEMBLY AND ASSEMBLY

The following instructions cover the complete disassembly and assembly of the tool. Where assemblies are pressed together and it is obvious that no new parts are required, do not disassemble. Even for complete reconditioning, disassembly should proceed only far enough for complete inspection and replacement of worn or damaged parts.

#### DISASSEMBLY (See cut on page 14)

1. Using the No. 562 Wrench, unscrew the Retaining Washer Screw (part 667) and remove the Cap Retaining Washer (part 675) and Reverse Cap (part 666). Unscrew the two Brush Retainer Screws (part 26), freeing the Brush Re-



tainers (part 25) and allowing the Brush Springs (part 28) and Brushes (part 12) to be withdrawn from the Holder Plate (part 14).

2. Using the No. 562 Hammer Case Cap Screw Wrench, unscrew the Hammer Case Cap Screws (part 638) and remove the Hammer Case (part 727P) from the Housing Cover (part 720).
3. Slide Anvil (part 726P) out of Hammer Case.
4. Grasp the Hammer (part 724P) and lift complete unit with gearing from Housing Cover (part 720).
5. Grasp the pinion in copper covered vise jaws and pull back on Housing (part 40) withdrawing Housing Cover and Armature assembly from Housing.
6. If necessary to remove the Trigger (part 93), drive the Trigger Stop Pin (part 74) out of the Housing with a small punch.
7. Unscrew and remove the two Handle Plate Screws, Short (part 226) and Handle Plate Screw, Long (part 229) and lift Handle Plate (part 224) from Housing.
8. Remove the Switch Screw (part 262), Switch Pivot Screw (part 359) and Ground Wire Screw (part 26), being careful not to lose the Lock Washers. Unscrew binding post screws from Switch (part 255) and detach the Cable wires and the two long leads from the Field (part 54).
9. Unscrew the Field Lead Nuts (part 139) and remove the short Field leads from the Spacer Screws (part 16).
10. Unscrew the Deflector Stud Nuts (part 353) from the Deflector Studs and slide the Deflector (part 23) and Field (part 54) from the Housing.
11. Unscrew the Spacer Screws (part 16) and remove the Spacer Screw Nuts (part 17), Stationary Contacts (part 20), Plate Spacers (part 15) and Brush Holder Plate (part 14).
12. Removal of the Hammer unit from the Planet Gear Frame has been described in Maintenance Instructions No. 2. To complete the disassembly of this part, pry the Gear Frame Thrust Bearing (part 97) off the end of the Planet Gear Frame (part 8P) with two screw drivers placed under diametrically opposite sides of the Bearing. Support this end of the Gear Frame and press out the Planet Gear Shafts (part 191) freeing the Planet Gears (part 10). **Always press or drive Shafts out toward short end of Gear Frame.**

## BUSHINGS

Planet Gears are equipped with bronze Planet Gear Bushings (part 500). These Bushings are renewable

and can be removed by pressing out with a suitable arbor while supporting either face of the Planet Gear. Press new Bushing in until the ends do not project from either face of the Gear.

The Hammer Case (part 727P) is fitted with bronze Hammer Case Bushing (part 641P). This Bushing is renewable. Removal of the old Bushing can be accomplished by squarely supporting the back face of the Hammer Case and pressing on the front end of the Bushing with a suitable Arbor preferably piloted in the bore of the Bushing. Installation of the new Bushing is a direct reversal. However, make sure that oil hole in Bushing is in alignment with oil groove in Hammer Case. Make sure new Bushing is pressed in as far as possible; that is until Flange on Bushing seats against shoulder in Hammer Case.

## SOCKET RETAINER REPLACEMENT

The Socket Retainer (part 815) consists of three pieces—plunger, spring and washer. Do not remove the Retainer from the Anvil square unless replacement parts are on hand as the plunger and washer are destroyed in the process of removal. To remove, insert a  $\frac{1}{8}$ " drill into the hole in the Anvil square on the side opposite the protruding end of the plunger and drill away the peened end of the plunger, releasing the washer. Withdraw the plunger and spring from the opposite side of the Anvil square.

Note that the holes drilled in opposite sides of the Anvil square are not of the same depth. To assemble, place the spring in the deeper hole and insert the small end of the plunger into the spring. Turn the Anvil square and place it against a solid, flat surface so that the large, ball end of the plunger is pushed into the square, flush with its face. This causes the small end of the plunger to project from the opposite side. Place the washer over the small end of the plunger until it seats against the shoulder. Using a small punch, peen over the small end of the plunger, locking the washer in position.

## BEARINGS

Armature Bearings (parts 22 and 24) should be removed only when replacement is necessary and in such cases the use of a bearing puller is recommended.

## FAN

Care should be taken so that the Fan (part 62) is not needlessly damaged, for although it is available as a replacement part, the use of a new Fan on an old Armature (part 53) may cause some vibration. Armatures are dynamically balanced after the Fan is installed at the factory. Armatures furnished as replacement parts will be assembled with a Fan and will be balanced.

## ASSEMBLY

1. Place the Planet Gears (part 10), containing



Deflector (part 23). Insert studs through Field holes and holes in Housing and retain with Deflector Stud Nuts

Bend short leads back over Field

Attach top lead here

Bottom lead

Attach bottom lead here

With Field in place bend long leads back and insert into grip section; eventually attaching to lower posts of Switch.

Reverse Stop (part 665). Install on Deflector stud and enter in this slot.

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Fig. 5—Attaching the Leads.

Planet Gear Bushings (part 500), into the Planet Gear Frame (part 8P). Insert the Planet Gear Shafts (part 191) into the Gear Frame **from the short end** and press in flush. Install Gear Frame Thrust Bearing (part 97) on the Gear Frame. Do all pressing or driving on the inner race of the Bearing when installing.

2. Slide the Hammer Spring Thrust Bearing Spacer (part 331) followed by the Hammer Spring Thrust Bearing (part 695P) over the pilot end of the Planet Gear Frame. Be sure that the Bearing is well lubricated with No. 100 Impact Wrench Grease before installing, as it is difficult to lubricate after assembling it in the Hammer. Note that there is a difference in the width of the races of the Hammer Spring Thrust Bearing. The wider race must go on first and must be installed so that the **smooth side** seats against the Spacer. Follow this with the bearing balls in their retainer, the narrow race (grooved side first), the Hammer Spring (part 728P) and the Hammer (part 724P). Support the rear end of the Planet Gear Frame and press upon jaws of Hammer, compressing the Hammer Spring (part 728P) until the Cam Balls (part 722P) can be inserted into the cam grooves of the Planet Gear Frame. Insert one ball on each side of the Gear Frame Spindle.
3. Place the Brush Holder Plate (part 14) in position in Housing. Slide Screw Insulating Washer (part 19) followed by a Screw Insulating Bushing (part 18) onto a Spacer Screw (part 16). Insert the Screw through Housing and Brush Holder Plate. Apply the Plate Spacer (part 15) and Stationary

Contact (part 20) to the Screw. Hold the Spacer Screw Nut (part 17) so that the flat contacts the protruding lip of the Plate Spacer and turn Screw into Nut. Install the second Spacer Screw and accompanying parts.

4. Bend one short lead back over the top of the Field (part 54) and the other one back underneath. (See Cut). Insert the Field into the Housing (part 40) so that the long leads face the front and the Deflector stud holes are in alignment with the holes in the rear of the Housing. Insert the two long leads down into the grip section and attach to lower posts of Switch. Retain Field in Housing by installing Deflector (part 23), passing Deflector studs through the Field and the holes in the bosses at the rear of the Housing. Apply the Reverse Stop (part 665) to the one Deflector stud that allows the Stop to fit into the milled slot in the Housing. Slip a Lock Washer (part 352) over the end of each stud and apply and tighten the two Deflector Stud Nuts (part 353).
5. Slip one short Field lead over the end of each Spacer Screw (part 16) and retain with Field Lead Nut (part 139). **Important:**—The lead from the top coil of the Field must be attached to the top Screw otherwise excessive arcing will be noted and power will be affected. An indication of correct wiring is that the square driver rotates in the forward direction (counterclockwise when looking at front of Tool) when the index mark on the Reverse Cap is in alignment with the one on the Housing. If tool runs in reverse direction when marks are aligned, the Field leads are connected to the wrong posts.



6. If Armature Bearings (parts 22 and 24) were removed replace on Armature (part 53), felt-sealed side first. On the felt-sealed side the faces of inner and outer races are flush while on the opposite side the face of the inner race is slightly lower than the face of the outer race. This can be determined by laying the edge of a scale across the Bearing faces. When installing the Bearings do all pressing or driving on the **inner** races. Use a sleeve that will slip over the Armature pinion to contact the inner race of the Front Armature Bearing (part 24) and press or drive on the end of this sleeve. Place the Rear Armature Bearing Spring (part 278) in seat in rear of Housing. Place Spring so that flat side seats in Housing. Slide the Armature assembly into the Housing.
7. Align cap screw holes and apply the Housing Cover (part 720) tapping it lightly to seat Front Armature Bearing (part 24) into seat in Cover.
8. Place Planet Gear Frame, completely assembled with Hammer, in position, meshing teeth of Planet Gears with those of the Armature pinion. Tap end of Gear Frame lightly to seat Gear Frame Thrust Bearing (part 97) into seat in Housing Cover.
9. Apply Ingersoll-Rand Impact Wrench Grease No. 100 to the gears, jaws of the Hammer and pilot of the Gear Frame. Install Anvil on pilot of Gear Frame and apply a small quantity of No. 100 Grease to its jaws and bearing surfaces. Slide the Hammer Case (part 727P) over the impact unit, meshing the teeth of the Internal Gear with the Planet Gears. Retain with Hammer Case Cap Screws.
10. Insert Brushes (part 12) and Brush Springs (part 28) in Brush Holder and retain with Brush Retainers (part 25) and Brush Retainer Screws (part 26).
11. Apply the Reverse Cap (part 666) so that each lug on the Brush Holder Plate is located between the small ribs cast within the Cap and so that the Reverse Stop (part 665) enters elongated slot in Cap. Retain with Cap Retaining Washer (part 675) and Retaining Washer Screw (part 667). Use No. 562 Wrench, furnished with Tool, to tighten Screw.
12. Attach the **green** wire of the Cable to the small boss in the Housing grip section using Ground Wire Screw (part 26) with Ground Wire Screw Lock Washer (part 27). Attach the other two Cable wires to the top posts of the Switch (part 255). Place the Switch in position in the Housing and retain with the Switch Pivot Screw (part 359) inserted through the switch arm and into the Housing and with the Switch Screw (part 262) and Switch Screw Lock Washer (part 263)

inserted through the front of the Housing grip section and into the Switch. Apply Handle Plate (part 224) to Housing and retain with the two Handle Plate Screws, Short (part 226) at the bottom and the one Handle Plate Screw, Long (part 229) at the top.

## APPLICATIONS

The Size 4U, because of its design and construction, can be used on a multitude of applications. It would be impossible to tabulate a complete list of jobs for which the 4U is recommended. In fact the Size 4U can be used for any job requiring intermittent rotary motion within its power range. The ball and cam impact unit makes it impossible to overload the motor, and only a negligible amount of torque reaction is transmitted to the operator. **Regardless of how much resistance is offered by the work the motor can not be stalled, yet the torque reaction transmitted to the operator never increases.**

The Size 4U is recommended for removing and applying nuts and cap screws, drilling, reaming, tapping, wire brushing, screw driving and masonry drilling, to name a few of the more common uses, and the following paragraphs contain illustrations and descriptions of accessories, both standard and extra, for performing these jobs.

### Applying and Removing Nuts and Cap Screws

Hexagon and square Sockets, both standard and bolt clearance types, are listed on page 16. All Sockets fit directly onto the square driver of the Anvil where they are held by a ball-type Socket Retainer (part 815) which prevents the Socket from jarring or falling off but allows its quick removal when desired.

To remove nuts or cap screws turn the Reverse Cap (part 666) so that Socket rotates in clockwise direction when looking at front of Tool. Apply Socket to nut and depress Trigger. The Tool will impact until the nut is loosened after which the Hammer and Anvil will rotate as a single unit, running the nut off the stud or bolt. When nut is removed, release Trigger, move to next nut and repeat operation. **Caution:**—If nut is frozen and fails to loosen after about ten seconds of impacting, remove Socket and move to another nut, coming back to the frozen one later.

To run down and tighten nuts or cap screws turn the Reverse Cap to the forward position (so that fin on Cap is in alignment with fin on Housing), apply the Socket to the nut or cap screw and depress the Trigger. After the nut has been rapidly run down against the work, the impacting action starts, tightening the nut progressively by continuing repetitions of rotary impacts. Unlike other nut-running devices whose capacity is limited by the power of the motor or by a kick-out clutch, the Size 4U continues to exert torque and tightens the



nut as long as it is allowed to impact. For this reason do not hold the tool on the work long enough to strip the threads.

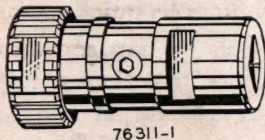
## ACCESSORIES

Four main items of accessories, all of which snap onto the square driver of the Anvil, permit the Size 4U to be adapted to numerous applications besides nut running. These are:—

1. No. 99 Collet Type Chuck—for using Twist Drills, Masonry Drills, Screw Extractors, Taps, Hole Saws, and Carbon Removing Wire Brushes.
2. No. 323-2 No. 2 Morse Taper Socket—for using Short Bridge Reamers with No. 2 Morse Taper shanks. By inserting the No. 324 Sleeve (No. 1 to No. 2 Morse Taper) into this Socket, Short Bridge Reamers with No. 1 Morse Taper shanks or Twist Drills with No. 1 Morse Taper shanks can be used.
3. No. 812 Screw Driver Adapter—for using square insert bits to drive Phillips or Reed-Prince recessed head screws.
4. No. A295-7 Quick Change Chuck—for using solid screw driver bits with  $\frac{7}{16}$ " hexagon shanks for driving slotted head screws, Phillips recessed head screws, Reed-Prince recessed head screws, clutch head screws and hollow-hexagon head screws.

## COLLET TYPE CHUCK—Part No. 99

(See page 17 for Sectional view).



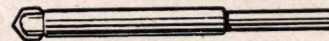
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A collet with rubber-bonded jaws, located in the front of this Chuck, grasps and drives those items of accessories having straight, round shanks. The back section of the Chuck contains an adjustable square recess to accommodate the square on the shanks of Taps and Screw Extractors while the collet jaws center and hold these tools. Normally, the collet jaws will hold round shank tools securely against rotation in the Chuck. However, if slippage is encountered on applications where impacting occurs, such as enlarging an existing hole with a  $\frac{3}{8}$ " drill, the condition can be remedied by grinding a square on the end of the shank so that it can be held and driven the same as a Tap.

The Back Jaws of the Chuck should always be tightly closed against the retaining pin when using round shank tools and the end of the shank firmly seated against the closed jaws.

To tighten the Chuck Nut (part 104) after inserting a tool, it is customary to hold the Nut stationary with the hand and operate the 4U in the forward direction allowing it to impact. Where exceptional tightness is required, as for round shank tools with no square driving end, it may be necessary to hold the Chuck Nut with the No. 253 Chuck Nut Wrench and allow the 4U to impact. When the latter procedure is followed, care must be taken that the impacting is not allowed to continue for too long a period of time as the powerful impact blows will cause the Nut to be tightened to such an extent that it will split open. Three or four impact blows are sufficient.

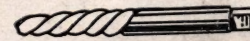
## Masonry Drills—Part No. 450



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The Size 4U, when equipped with the Collet Type Chuck and a Masonry Drill is capable of drilling holes up to  $\frac{3}{8}$ " diameter in brick, concrete, plaster and all ordinary types of non-metallic construction materials. These Drills are available in  $\frac{1}{4}$ ",  $\frac{5}{16}$ " and  $\frac{3}{8}$ " diameters for use in this Tool. Order as Part No. 450 and specify diameter required.

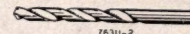
## Screw Extractors—Part No. 451



76311-5

The Screw Extractor is used in the Collet Type Chuck when it becomes necessary to remove, from an assembly, a cap screw or stud which has broken off too close to the surface to permit its removal by any other means. The broken screw must first be drilled with the size drill specified on the Extractor. The Chuck Back Jaws are adjustable to accommodate the square on the shank of the Extractor, while the rubber-bonded collet jaws of the Chuck prevent the Extractor from slipping out. For this operation the 4U must be operated in the reverse direction. Impacting quickly loosens the screw or stud.

## Twist Drills—Part No. 453



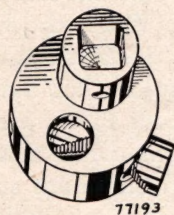
76311-2

When using twist drills in Size 4U equipped with Collet Type Chuck, enough pressure should be applied to provide sufficient feed for the drill but not enough to cause the impact unit to be brought into continuous operation. The Chuck accommodates straight, round shank twist drills from  $\frac{3}{16}$ " to  $\frac{3}{8}$ " inclusive. Size 4U has a rated drilling capacity of  $\frac{1}{4}$ " for direct drilling in steel and up to and including  $\frac{1}{2}$ " for enlarging existing holes in steel. When using



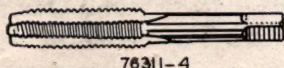
twist drills over  $\frac{3}{8}$ " diameter, the Collet Type Chuck must be replaced by the Morse Taper Socket and Sleeve (see below, right hand column) and the twist drills must have Morse Taper Shanks.

#### Stud Remover—Part No. 457



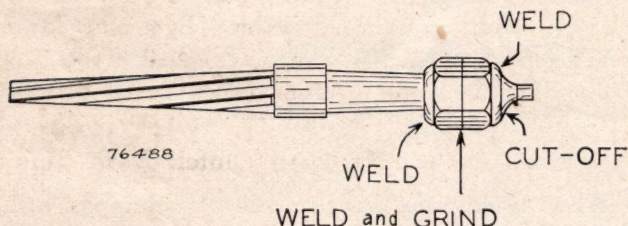
With this attachment, which snaps directly onto the square driver, the 4U can be used for removing or driving studs. The Stud Remover grips the stud tightly when power is applied, but releases as soon as driving pressure is relaxed; thus it may be readily moved from one stud to another. Capacity is  $\frac{3}{8}$ " to  $\frac{1}{2}$ " diameter studs inclusive.

#### Taps—Part No. 452

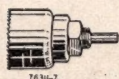


The Size 4U, equipped with Collet Type Chuck and one of the above Taps, makes an excellent tapping machine. The adjustable Chuck Back Jaws clamp onto the square on the shank of the Tap for driving while the Collet Jaws retain the Tap in the Chuck. The impacting action causes the Tap to be driven easily while transmitting practically no torque reaction to the operator. The Size 4U handles  $\frac{1}{4}$ " through  $\frac{1}{2}$ " diameter taps, either N.C. or N.F. thread. Order under Part No. 452 and state size.

**Note:**—For occasional jobs, some users of Size 4U have found it convenient to tack-weld a standard hex. nut onto the shank of round-shank tools so that they can be used in a standard Socket. This arrangement is shown in the following sketch.



#### Hole Saws—Part No. 454



Hole Saws up to and including  $1\frac{1}{2}$ " diameter are another item of accessories that can be used on Size

4U equipped with a Collet Type Chuck. When ordering, specify size required. (See Part List, Pg. 15).

#### Carbon Removing Wire Brushes—Part No. 455



Carbon Removing Wire Brushes are widely used in garages and machine shops in the reconditioning and maintenance of automobile, tractor, or other internal combustion engines. They can be readily applied to the Size 4U, equipped with Collet Type Chuck. Three types of this Brush are available to accomplish all phases of the carbon removal operation. They are:—

- Heavy-duty solid wire-filled Brush—Part No. 455A
- Side-flare Brush for close corner work—Part No. 455B.
- Hollow core, flare-bottom Brush—Part No. 455C.

#### No. 2 MORSE TAPER SOCKET—Part No. 323-2



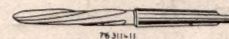
This Socket, snapped onto the square driver of Size 4U, permits the use of Short Bridge Reamers with No. 2 Morse Taper shanks.

#### No. 1 to No. 2 Morse Taper Sleeve—Part No. 324



This Sleeve is inserted into the No. 323-2 Socket to adapt it to the use of Short Bridge Reamers with No. 1 Morse Taper shanks or Twist Drills with No. 1 Morse Taper shanks.

#### Short Bridge Reamers—Part No. 456



These are spiral fluted reamers, tapered from the front end for a portion of their length, for enlarging existing holes in metal and for aligning holes in adjacent metal parts through which a bolt, cap screw or rivet must be inserted. They have either a No. 1 or No. 2 Morse Taper Shank, depending upon the diameter. Those with No. 2 M.T. shanks are for use in Size 4U equipped with a No. 2 Morse Taper Socket (part 323-2). To use those with No. 1 M.T. shanks, the Sleeve (part 324) is inserted into the Socket. The  $\frac{5}{16}$ " and  $\frac{3}{8}$ " diameter Reamers have a No. 1 M.T. shank while the  $\frac{7}{16}$ " and  $\frac{1}{2}$ " have a No. 2 M.T. shank. Order under Part No. 456 and specify size.

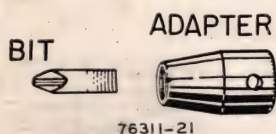


## Wood Auger—Part No. 458



The machine Wood Auger up to and including  $\frac{29}{32}$ " diameter is another item that can be used on Size 4U equipped with either a No. 2 Morse Taper Socket or a No. 2 Morse Taper Socket and No. 1 to No. 2 Morse Taper Sleeve. Machine Wood Augers up to and including  $\frac{1}{6}$ " diameter have No. 1 Morse Taper Shanks while those from  $\frac{1}{2}$ " diameter to  $\frac{29}{32}$ " diameter inclusive have No. 2 Morse Taper Shanks. When ordering specify size required (see part list, page 15).

## SCREW DRIVER ADAPTER—Part No. 812



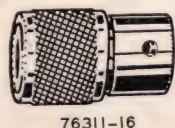
This short Adapter, which snaps onto the square driver of the Anvil, takes square Phillips or square Reed-Prince Insert Bits for driving Phillips or Reed-Prince recessed head screws. The insert Bits are retained by a snap ring in the Adapter, can be quickly and easily changed and are economical to use.

### Square Phillips and Square Reed-Prince Bits—Types SPB and SRPB (Shown above with Adapter).

These small Bits are  $\frac{5}{16}$ " square and are inserted in the  $\frac{5}{16}$ " square hole in the front of the No. 812 Adapter, where they are retained by a snap ring. Two Phillips point sizes are available to cover the range of Phillips head screws that can be driven with Size 4U with No. 812 Adapter. Square Phillips Bit (part SPB-083-5) is for driving all sizes of screws having a No. 3 Phillips head, while Square Phillips Bit (part SPB-084-5) is for driving all sizes of screws having a No. 4 Phillips head. One size of Square Reed-Prince Bit (SRPB-081-5) is used for driving Reed-Prince screws of all sizes. (See chart in Part List section).

## QUICK CHANGE CHUCK—Part No. A925-7

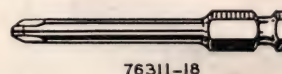
(See Page 18 for sectional view)



The Quick Change Chuck snaps onto the square

driver of Size 4U and takes all types of solid Screw Driver Bits having  $\frac{7}{16}$ " hexagon shanks. A ball lock, manipulated by a sliding sleeve, permits a quick change from one type or size of Bit to another. Sliding the sleeve forward about  $\frac{1}{8}$ " releases the lock and allows the Screw Driver Bit to drop from or be withdrawn from the Chuck. With the sleeve held forward, the hexagon shank of another type or size of Bit is inserted in the Chuck and securely locked in position by releasing the sleeve. (See Part List section for sectional view and the listing of component parts). All of the following types of Screw Driver Bits can be used with this Quick Change Chuck.

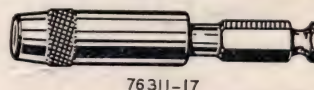
### Bit for Phillips Recessed Head Screws—Type P Bit for Reed-Prince Recessed Head Screws—Type RP



Both of the above types are used in Size 4U equipped with a No. A925-7 Quick Change Chuck. The Phillips Bit is available in two point sizes for driving the range of Phillips recessed head screws falling within the capacity of Size 4U. (See Part List section for illustrations and table of screw sizes handled by each point size).

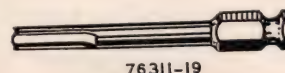
The Reed-Prince Bit is furnished in only one point size which drives all sizes of screws with Reed-Prince recessed heads.

### Flat Bit with Rotating Finder—Types R and RH



These Bits are used in Size 4U with No. A925-7 Quick Change Chuck for driving slotted head screws (See Part List section for sectional views and table of sizes for the various sizes of screws). Type R Bits are the solid type, while in Type RH the blade is an insert, held in the driving shank by a pin. The latter construction provides for economical blade replacement in the event of breakage.

### Clutch Bit for Recessed Clutch Head Screws—Type C



This Bit is used for driving recessed Clutch Head Screws. See table in Part List section for the sizes of clutch for the various sizes of screws. The Bit is used in the Quick Change Chuck, Part A925-7.

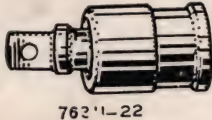


### Bit for Hollow Hexagon Head Screws—Type HX.



This Bit has a hexagon driving end for driving cap screws with hollow hexagon heads. See table in Part List section for the sizes of Bit hex. for the various sizes of screws. The Bit is used in the Quick Change Chuck, Part A925-7.

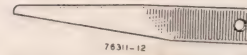
### UNIVERSAL JOINT—Part No. 670



The Universal Joint is used on applications where space does not permit the Impact Tool to be held in axial alignment with the Socket. The joint is of rugged construction suitable for impact service, having a

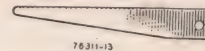
hexagon male section rolling within a hexagonal socket. The Universal Joint snaps onto the  $\frac{1}{2}$ " square driver of Size 4U and has a  $\frac{1}{2}$ " square driver to take the Socket.

### No. 2 Morse Taper Drift—Part No. 325-2



This Drift is for loosening and removing a Reamer with No. 2 M.T. shank from the Morse Taper Socket (part 323-2) or for removing the Sleeve from this Socket.

### No. 1 Morse Taper Drift—Part No. 325-1



This Drift is for loosening and removing a Reamer with No. 1 M.T. shank from the Sleeve (part 324).



4U Electric Impact Tool with Stud Remover (Part No. 457) removes manifold studs.



Electric Impact Tool with Collet Type Chuck and Wire Brush (Part No. 455) cleaning hardened chemical from pan.





A hole for a hanger strap is drilled with the Electric Impact Tool equipped with Collet Type Chuck and Masonry Drill (Part No. 45)).



Reaming a  $\frac{3}{8}$ " hole in corner bracket. Standard reamer is used with Collet Type Chuck.



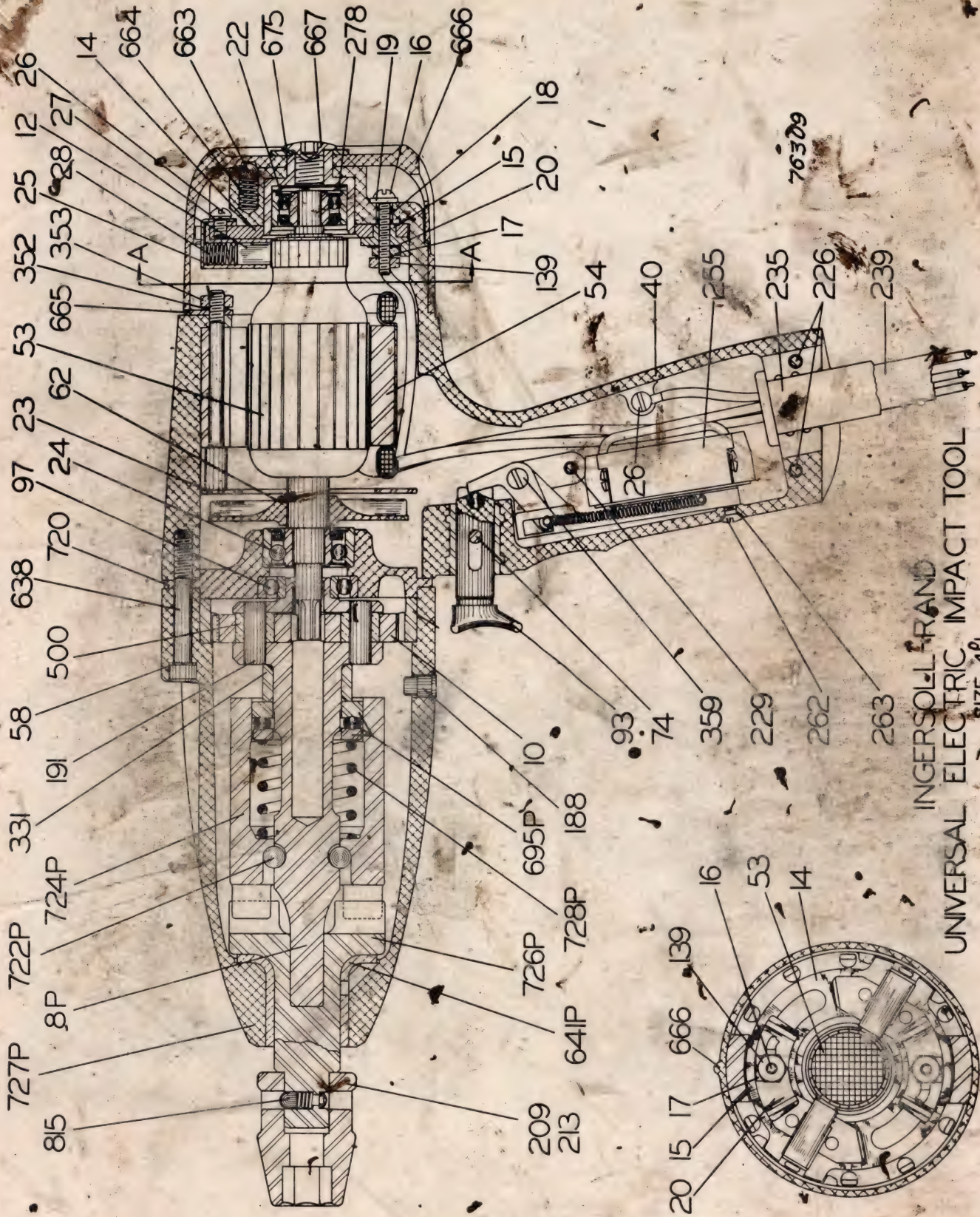
Tapping with Electric Impact Tool equipped with Collet Type Chuck and Tap (Part No. 452).



Electric Impact Tool with Hex. Socket (Part No. 209) for applying and removing  $\frac{3}{4}$ " cap screws on jitney overhaul.



# SIZE 4U UNIVERSAL ELECTRIC IMPACT TOOL



INGERSOLL RAND  
UNIVERSAL ELECTRIC IMPACT TOOL  
SIZE 4U



# PART LIST SIZE 4L UNIVERSAL ELECTRIC IMPACT TOOL

NOTE.—When ordering Spare Parts, please give the Size and Serial Number of the machine as well as the Name and Number of the Part required as shown in list. Parts can be ordered from nearest Distributor or Branch Office.

Ingersoll Rand tools have a life-time guarantee if repaired by a dealer than Ingersoll Rand.

IF NECESSARY TO SEND A TOOL TO THE FACTORY FOR REPAIRS, INQUIRE OF NEAREST DISTRIBUTOR OR BRANCH OFFICE FOR SPECIAL INSTRUCTIONS.

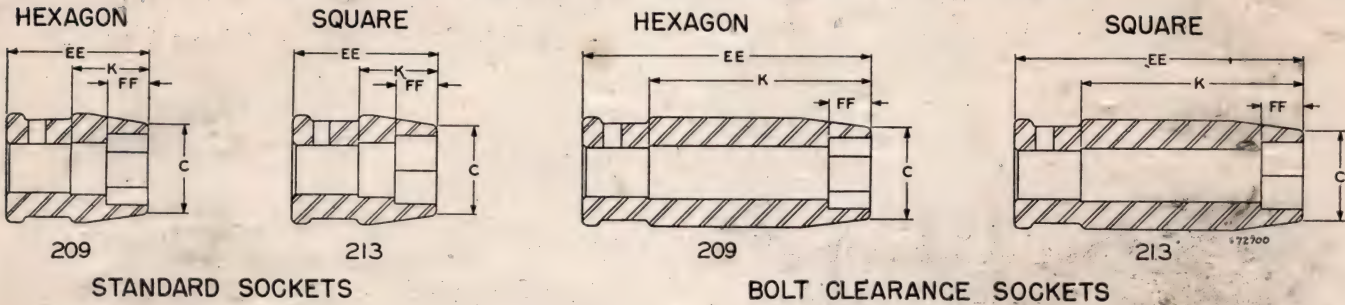
SEE LAST PAGE FOR ADDRESSES.

Part No.	Name of Part	Part No.	Name of Part
8P	Planet Gear Frame	455B	Carbon Removing Wire Brush (Side-flare Brush for close corner work)
A8P	Planet Gear Frame Complete (includes parts 8P, 10 (2), 97, 191 (2), 331 and (2) 500)	455C	Carbon Removing Wire Brush (Hollow core, flare-bottom Brush)
10	Planet Gear (includes part 500) (2)	456	Short Bridge Reamer (3/6", 3/8", 7/16" or 1/2" diameter tapered reamers with Morse Taper shanks—specify size)
12	Brush (2)	457	Stud Remover
14	Brush Holder Plate	458	Wood Auger (3/8" and 1/2" diameters with No. 1 Morse Taper shank; 5/8", 3/4" and 29/32" diameters with No. 2 Morse Taper shank) (specify diameter)
15	Plate Spacer (2)	500	Planet Gear Bushing (2)
16	Spacer Screw, (includes parts 17, 18, 19, 139 and 351) (2)	62	Hammer Case Cap Screw Wrench or Retaining Washer Screw Wrench
17	Spacer Screw Nut (2)	638	Hammer Case Cap Screws (3)
18	Screw Insulating Bushing (2)	641P	Hammer Case Bushing
19	Screw Insulating Washer (2)	663	Reverse Lock Ball (2)
20	Stationary Contact (2)	664	Reverse Lock Spring (2)
22	Rear Armature Bearing	665	Reverse Stop
23	Deflector (includes parts 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000)	500	Planet Gear Bushing (2)
22	Rear Armature Bearing	62	Hammer Case Cap Screw Wrench or Retaining Washer Screw Wrench
23	Deflector (includes parts 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000)	62	Hammer Case Cap Screw Wrench or Retaining Washer Screw Wrench
24	Front Armature Bearing	638	Hammer Case Cap Screws (3)
25	Brush Retainer (2)	641P	Hammer Case Bushing
26	Brush Retainer Spring	663	Reverse Lock Ball (2)
27	Brush Retainer Spring	664	Reverse Lock Spring (2)
28	Wire Spring	665	Reverse Stop
30	Brush Spring	666	Reverse Cap
40	Housing (includes parts 26, 27, 58 (3), 74, 93, 224, 226 (2), 229, 320 (3), 638 (3), 663 (2), 664 (2), 667 and 675)	667	Retaining Washer Screw
53	Armature (includes part 62)	670	Universal Joint
54	Field	675	Cap Retaining Washer
58	Hammer Case Cap Screw Lock Washer (3)	695P	Hammer Spring Thrust Bearing
62	Fan	720	Housing Cover
74	Trigger Stop Pin	722P	Cap Ball (2)
93	Trigger	724P	Hammer
97	Gear Frame Thrust Bearing	A724P	Hammer Complete (includes parts 8, 10 (2), 97, 191 (2), 331, 500 (2), 695P, 722P (2), 724P and 728P)
139	Collet Type Chuck (see page 17)	726P	Hammer Complete (includes part 815)
188	Field Lead Nut (2)	727P	Hammer Case (includes parts 188 and 641P)
191	Grease Fitting	728P	Hammer Spring
209	Planet Gear Shaft (2)	815	Socket Retainer (consists of plunger, spring and washer)
	Hex Socket (size as specified)—See Table on	A925-7	Quick Change Chuck Complete (see page 18)



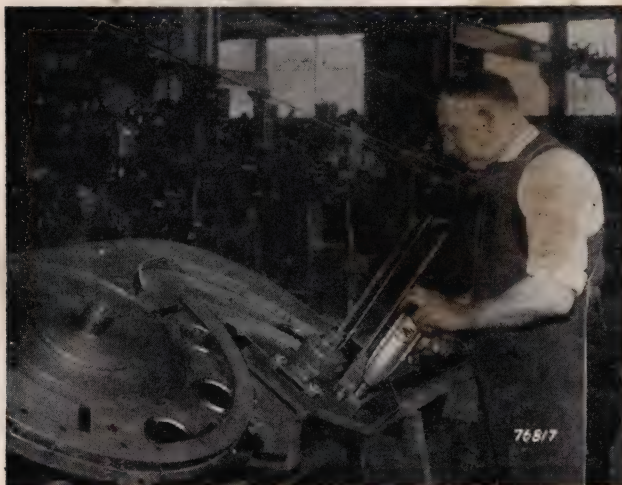
# ACCESSORY PART LIST

## SOCKETS FOR 4U UNIVERSAL ELECTRIC IMPACT TOOL



Std. Socket No.	Bolt Clear. Socket No.	Distance Across Flats, Inches		Standard Sockets		Bolt Clearance Sockets		All Sockets			American Standard, Bolt Size					
		Nominal	Actual	EE Length Overall, Inches	K Bolt Clearance, Inches	EE Length Overall, Inches	K Bolt Clearance, Inches	Max. Outside Dia., Inches	FF Distance Nut will enter Socket, Inches	C Dia. at Socket End, Inches	Regular Series		Heavy Series	Light Series	Cap Screws	
											Bolts, Unfinished and Semi-finished	Bolts, Finished	Jam Nuts, Former U. S. Standard. See Note for Exception	Nuts and Castle Nuts (Same as S. A. E.)		
No. 209 SOCKETS FOR HEXAGON NUTS																
IP-120	SIP-120	$\frac{3}{8}$	.382	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{1}{4}$				
IP-140	SIP-140	$\frac{1}{2}$	.445	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{5}{16}$	$\frac{25}{32}$				$\frac{1}{4}$	$\frac{1}{4}$
IP-160	SIP-160	$\frac{5}{8}$	.508	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{3}{8}$	$\frac{25}{32}$	$\frac{5}{16}$			$\frac{5}{16}$	$\frac{5}{16}$
IP-180	SIP-180	$\frac{7}{8}$	.571	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{7}{8}$	$\frac{13}{16}$	$\frac{3}{8}$			$\frac{3}{8}$	$\frac{3}{8}$
IP-200	SIP-200	$\frac{1}{1}$	.633	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$1\frac{1}{16}$	$\frac{13}{16}$	$\frac{1}{2}$			$\frac{1}{2}$	$\frac{1}{2}$
IP-220	SIP-220	$1\frac{1}{8}$	.699	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{1}{2}$	$1\frac{1}{2}$					
IP-240	SIP-240	$\frac{3}{4}$	.762	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{9}{16}$	$1\frac{1}{8}$	$\frac{1}{2}$			$\frac{1}{2}$	$\frac{1}{2}$
IP-250	SIP-250	$1\frac{1}{8}$	.794	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{5}{8}$	$1\frac{1}{8}$					
IP-260	SIP-260	$1\frac{1}{2}$	.823	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{5}{8}$	$1\frac{1}{8}$				$\frac{5}{8}$	$\frac{5}{8}$
IP-280	SIP-280	$\frac{1}{1}$	.887	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{2}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{1}{1}$	$1\frac{1}{8}$				$\frac{1}{1}$	$\frac{1}{1}$
No. 213 SOCKETS FOR SQUARE NUTS																
IP-312A	SIP-312A	$\frac{3}{8}$	.381	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{1}{4}$				
IP-314	SIP-314	$\frac{1}{2}$	.443	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{5}{16}$	$\frac{21}{32}$				$\frac{1}{4}$	
IP-316	SIP-316	$\frac{5}{8}$	.507	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{3}{8}$	$\frac{15}{16}$	$\frac{5}{16}$				
IP-318	SIP-318	$\frac{7}{8}$	.570	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{8}$			$\frac{5}{16}$	
IP-320A	SIP-320A	$\frac{1}{1}$	.633	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$1\frac{1}{16}$	$1\frac{1}{8}$	$\frac{1}{2}$			$\frac{3}{8}$	
IP-322A	SIP-322A	$1\frac{1}{8}$	.696	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{9}{16}$	$1\frac{1}{4}$					
IP-324	SIP-324	$\frac{3}{4}$	.760	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{5}{8}$	$1\frac{1}{8}$	$\frac{1}{2}$			$\frac{1}{2}$	
IP-326	SIP-326	$1\frac{1}{8}$	.822	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{5}{8}$	$1\frac{1}{8}$				$\frac{1}{2}$	
IP-328	SIP-328	$1\frac{1}{2}$	.884	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{15}{16}$	$3\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{8}$	$\frac{1}{1}$	$1\frac{1}{8}$	$\frac{5}{16}$			$\frac{1}{1}$	

\*U. S. Standard only; not American Standard.



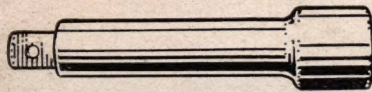
4U Electric Impact Tool with No. 209 Hex. Socket applying machine bolt nuts.



4U Electric Impact Tool with No. 209 Hex. Socket removing cap screws.



## Anvil Extension



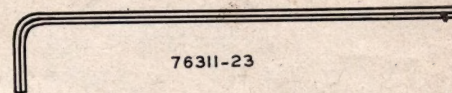
Part No.	Name of Part	Overall Length	Actual Extension
214-4	4" Anvil Extension	5"	4-3/8"
214-9	9" Anvil Extension	10"	9-3/8"



Electric Impact Tool with Anvil Extension (Part No. 214) and No. 209 Hex. Socket removing crankcase cap screws.

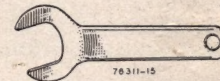
## WRENCHES

Hammer Case Cap Screw Wrench or  
Retaining Washer Screw Wrench—Part No. 562



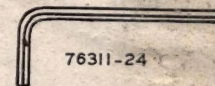
This Wrench is for applying or removing the No. 638 Hammer Case Cap Screws and the No. 667 Retaining Washer Screw. (Included with Impact Tool.)

Chuck Nut Wrench—Part No. 253



This Wrench is for tightening or loosening the No. 104 Nut on the front of No. 99 Collet Type Chuck. (Included with Collet Type Chuck.)

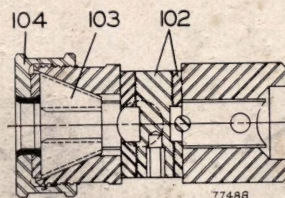
Chuck Back Jaw Wrench—Part No. 478



This Wrench is for tightening or loosening the No. 102 Back Jaws of No. 99 Collet Type Chuck. (included with Collet Type Chuck.)

## COLLET TYPE CHUCK - PART NO. 99

(For Drills, Taps, Masonry Drills, Wire Brushes, Hole Saws and Screw Extractors.)



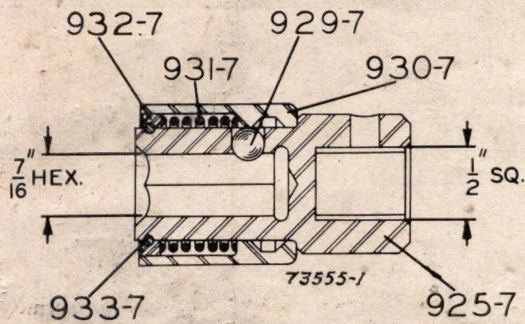
PART NO. 99  
COLLET TYPE CHUCK

Part No.	Name of Part
99	Collect Type Chuck Complete (includes all parts in this list)
102	Chuck Back Jaw Assembly (consists of one pair of jaws and adjusting screw)
103	Collet
104	Chuck Nut
253	Chuck Nut Wrench
478	Chuck Back Jaw Wrench



## SCREW DRIVING EQUIPMENT

### Quick Change Chuck (For all $\frac{7}{16}$ " Hex. Shank Bits)



No. A925-7 Quick Change Chuck

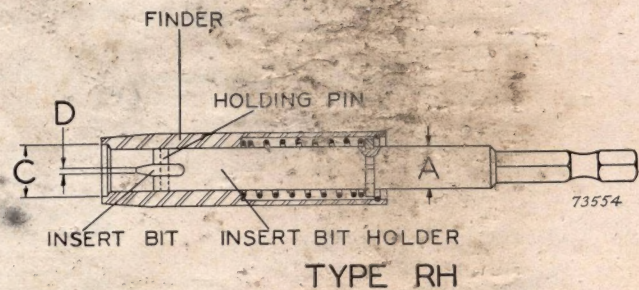
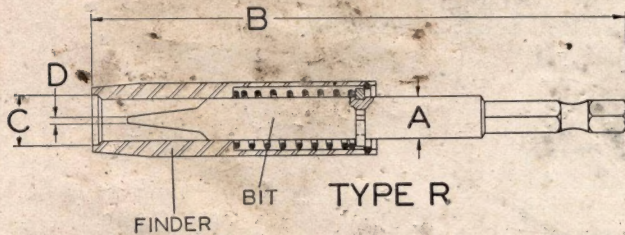
Part No.	Name of Part
A925-7	Quick Change Chuck Complete (includes all parts in this list)
925-7	Quick Change Chuck Body
929-7	Retaining Ball
930-7	Retaining Sleeve
931-7	Retaining Sleeve Spring
932-7	Thrust Ring
933-7	Thrust Ring Lock



Electric Impact Tool with Quick Change Chuck (Part No. A925-7). Bit and Finder driving self-tapping screws on repair job.

### Flat Bits with Rotating Finders for Slotted Head Screws

For use in No. A925-7 Quick Change Chuck



### BITS WITH $\frac{7}{16}$ " HEX. SHANKS

SCREW SIZES AND TYPES							COMPLETE ASSEMBLY NUMBER				COMPONENT PART NUMBERS				FINDER DIA. "C"	BLADE THICKNESS "D"
ROUND MACHINE OR WOOD	FLAT MACHINE OR WOOD	OVAL MACHINE OR WOOD	BINDING MACHINE	FILLISTER WOOD	FILLISTER MACHINE		BIT DIAMETER "A"	OVER-ALL LENGTH "B"	TYPE "R"	TYPE "RH"	FINDER	TYPE "R" BIT ONLY	TYPE "RH" INSERT BIT HOLDER	TYPE "RH" INSERT BIT AND HOLDING PIN		
12	10	10	10	12	12	1/4	.350"	3 3/4"	R3012-7	RH3012-7	R3012F	RF3012-7	RBH3012-7	RB3012	1/16"	.045"
14-1/4	12	12	12	14			.395"	3 3/4"	R3013-7	RH3013-7	R3013F	RF3013-7	RBH3013-7	RB3013	3/64"	.049"
16	14-1/4	14-1/4	1/4	16	5/16		.457"	3 3/8"	R3114-7	RH3114-7	R3114F	RF3114-7	RBH3114-7	RB3114	9/16"	.054"
18-5/16	16	16		18			.503"	3 7/8"	R3116-7		R3116F	RF3116-7			1/32"	.057"
20	18-5/16	18-5/16	5/16	20	3/8		.545"	3 7/8"	R3117-7		R3117F	RF3117-7			2/32"	.062"
22-3/8	20	20		22			.597"	3 7/8"	R3119-7		R3119F	RF3119-7			1/16"	.066"

MACHINE SCREWS LARGER THAN NO. 12 ARE DESIGNATED BY FRACTIONAL DIMENSIONS. IN SPACES CONTAINING BOTH NUMBER AND FRACTION, THE NUMBER DESIGNATES THE WOOD SCREW SIZE WHILE THE FRACTION APPLIES TO MACHINE SCREWS.

7/268-C

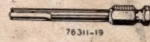


**7/16" Hex Shank Bits for Recessed Head Screws**  
**For use in No. A925-7 Quick Change Chuck**

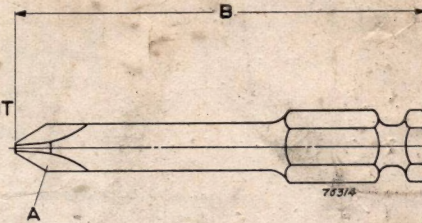
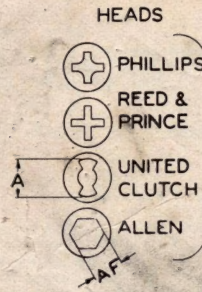
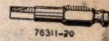
Phillips or Reed-Prince



United Clutch



Allen



SCREW SIZES AND TYPES						PART NUMBERS AND BIT DIMENSIONS		
Round	Flat or Oval	Binding Machine or Fillister Wood	Fillister Machine	Truss	Washer	Bit Size "A"	Dimension "B"	
							3 1/2"	4 1/2"
<b>FOR PHILLIPS HEAD SCREWS</b>								
12, 1/4", 5/16", 3/8", 1/2"	12, 1/4", 5/16", 3/8", 1/2"	12, 1/4", 5/16", 3/8", 1/2"	12, 1/4", 5/16", 3/8", 1/2"	12, 1/4", 5/16", 3/8", 1/2"	12, 1/4", 5/16", 3/8", 1/2"	No. 3 Point No. 4 Point	P283-7 P284-7	P363-7 P364-7
<b>FOR REED-PRINCE HEAD SCREWS</b>								
<b>ALL SIZES OF SCREWS</b>						One Size	RP282-7	RP362-7
<b>FOR CLUTCH HEAD SCREWS</b>								
12, 1/4", 5/16", 3/8", 1/2"	10, 1/4", 5/16", 3/8", 1/2"	12, 1/4", 5/16", 3/8", 1/2"	14, 1/4", 5/16", 3/8", 1/2"	10, 12, 14, 1/4", 5/16", 3/8", 1/2"	10, 12, 14, 1/4", 5/16", 3/8", 1/2"	5/16", 3/8", 1/2", 5/8", 3/4", 7/8", 1"	C286-7 C288-7 C289-7	C366-7 C368-7 C369-7
<b>HEX. DRIVE BITS FOR HOLLOW HEAD SCREWS</b>								
Cap Screw	Set Screws	Pipe Plugs	Size of Driving Hex. "AF"		Dimension "B"—2 1/2"			
1/4", 5/16", 3/8", 1/2", 5/8", 3/4", 7/8", 1"	3/8", 1/2", 5/8", 3/4", 7/8", 1" Allen	1/8", 1/4", 1/2", 3/8", 1/2", 3/4", 1"	5/16", 3/8", 1/2", 5/8", 3/4", 7/8", 1"		HX206-7 HX207-7 HX208-7 HX2010-7			

**Adapter and Bits for Phillips or Reed-Prince Recessed Head Screws**  
**(Taps onto square driver of Impact Tool)**

**TYPE SPB OR SRPB BIT**

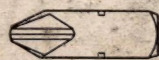


**812 ADAPTER**

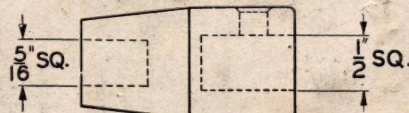


76311-21

Part No.	Name of Part
812	Screw Driver Adapter (For use with the square Phillips or Reed-Prince Bits listed below)
SPB-083-5	Phillips Bit (No. 3 Point)
SPB-084-5	Phillips Bit (No. 4 Point)
SRPB-081-5	Reed-Prince Bit
	See table on page 14 for screw sizes handled by No. 3 and No. 4 Point Bits.



**TYPE SPB OR SRPB BIT**



**812 ADAPTER**



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